

| L Number | Hits | Search Text | DB | Time stamp |
|----------|--------|---|---|---------------------|
| 1 | 38598 | flexib\$5 near5 substrate\$1 | USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB | 2003/07/25 09:05 |
| 2 | 1820 | ((349/12) or (345/173)).CCLS. | USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB | 2003/07/25 09:05 |
| 3 | 75 | (flexib\$5 near5 substrate\$1) and (((349/12) or (345/173)).CCLS.) | USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB | 2003/07/25 09:05 |
| 4 | 8 | ("4785564" "5627347" "5729319" "5774107" "5831702" "5835080" "5852487" "5867241").PN. | USPAT | 2003/07/25 10:07 |
| - | 15942 | touch\$3 adj panel | USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB | 2003/07/23 18:51 |
| - | 399038 | backlight or (back adj light) or (light adj source) | USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB | 2003/07/23 18:52 |
| - | 168 | (touch\$3 adj panel) and (backlight or (back adj light) or (light adj source)) and 349/\$ | USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB | 2003/07/24 16:40 |
| - | 40 | ((touch\$3 adj panel) same (backlight or (back adj light) or (light adj source))) and 349/\$ | USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB | 2003/07/24 09:37 |
| - | 351 | ((touch\$3 adj panel) same (backlight or (back adj light) or (light adj source))) | USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB | 2003/07/24 09:38 |
| - | 366129 | lcd or (liquid adj crystal) | USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB | 2003/07/24 09:39 |
| - | 242 | ((((touch\$3 adj panel) same (backlight or (back adj light) or (light adj source)))) and (lcd or (liquid adj crystal))) | USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB | 2003/07/24 09:39 |
| - | 88 | (touch\$3 adj panel) same (flexib\$5 near5 substrate\$1) | USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB | 2003/07/25 09:04 |

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CLAIMS

[Claim(s)]

[Claim 1] While a transparent touch panel is prepared ahead [of a liquid crystal display element / view visual direction] In the liquid crystal display with which the lighting system which can blink according to the luminosity of the circumference at the time of view ** prepares and grows into this liquid crystal display element The guard-plate combination light guide plate with which the aforementioned lighting system prepared linear or punctiform a detailed crevice or detailed heights in the field by the side of view ** of the guard plate of the aforementioned transparent touch panel as the reflective section, It is the liquid crystal display which consists of the light source confronted with the board thickness side of this guard-plate combination light guide plate, and is characterized by using the aforementioned liquid crystal display element as a reflected type.

[Claim 2] the above -- the path when considering as the path when considering as the width of face when considering as width of face when detailed irregularity is made into a linear crevice, and the depth and linear heights, and height and a punctiform crevice, and the depth and a punctiform crevice, and any of height -- although -- the liquid crystal display according to claim 1 characterized by being referred to as 0.3mm or less

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] Since in detail reduces the consumption of a cell about the liquid crystal display used as displays, such as a portable information terminal equipment, this invention reads a display by outdoor daylight, when the circumference is bright, and when the circumference is dark, it starts the liquid crystal display considered as the composition which reads a display by the built-in lighting system.

[0002]

[Description of the Prior Art] It is drawing 4 which shows the example of the composition of this conventional kind of liquid crystal display 90, and in this liquid crystal display 90, while the **** (transparency reflection) board 92 is formed in the tooth-back side of the liquid crystal display element 91, the light guide plate 93 of this ***** 92 which confronted the light sources 94, such as a cold cathode fluorescent lamp, with board thickness side 93a is further formed in the tooth back.

[0003] Linear or punctiform a detailed crevice or detailed heights is prepared in tooth-back 93b of the aforementioned light guide plate 93, and from the aforementioned light source 94, in this light guide plate 93, the light by which incidence was carried out shall be turned to surface 93c, and it shall be reflected. And the aforementioned light source 94 shall blink according to the surrounding luminosity.

[0004] Moreover, the press when the transparent touch panel 95 as an input means being formed in the view visual direction side of the aforementioned liquid crystal display element 91, in addition operating this transparent touch panel 95 gets across to the aforementioned liquid crystal display element 91, and in being extreme, in order for a display to become indistinct, or to prevent producing breakage, the guard plate 96 formed by the transparent resin etc. is formed between the liquid crystal display element 91 and the transparent touch panel 95.

[0005] Since it becomes what the outdoor daylight the circumference carried out [outdoor daylight] incidence into this liquid crystal display 90 in the bright situation reflects in aforementioned ***** 92 the liquid crystal display 90 considered as the above-mentioned composition, reaches a view ** person, and can perform read of a display, also in the state where the light source 94 was switched off, a display can fully be read. Therefore, the power for making the light source 94 turn on is reduced, and becomes extensible [a battery life].

[0006]

[Problem(s) to be Solved by the Invention] However, it sets to the liquid crystal display 90 of said conventional composition. The light guide plate 93 which it has when the circumference is dark and which is collected and boiled is what must be prepared. by this For example, it did not change like it in respect of what is used as a display of the device for tables, thickness, and weight, but the trouble which is not what fully fills a demand as a display for the portable equipment over which priority is given to a miniaturization and lightweight-ization is produced.

[0007] Moreover, in the situation that the circumference is bright, a display is read by the reflected light of outdoor daylight, i.e., the light which carries out the two-times transparency of the liquid crystal display element 91, the liquid crystal display element 91 is used as a reflected type, by the situation that the circumference is dark, a display is read by the transmitted light of the light from a light guide plate 93, i.e., the light which penetrates the liquid crystal display element 91 once, and the liquid crystal display element 91 is used as a penetrated type. Therefore, the trouble of having become what produces a difference under the situation that the bottom of the situation that the circumference is bright and the circumference are dark, and display grace having fallen to the contrast of a display etc., and giving a user sense of incongruity, for example was also produced, and solution of these points had considered as the technical problem.

[0008]

[Means for Solving the Problem] As a concrete means for solving said conventional technical problem, while a

transparent touch panel is prepared ahead [of a liquid crystal display element / view visual direction], this invention In the liquid crystal display with which the lighting system which can blink according to the luminosity of the circumference at the time of view ** prepares and grows into this liquid crystal display element The guard-plate combination light guide plate with which the aforementioned lighting system prepared linear or punctiform a detailed crevice or detailed heights in the field by the side of view ** of the guard plate of the aforementioned transparent touch panel as the reflective section, It consists of the light source confronted with the board thickness side of this guard-plate combination light guide plate, and a technical problem is solved by offering the liquid crystal display characterized by using the aforementioned liquid crystal display element as a reflected type.

[0009]

[Embodiments of the Invention] Below, this invention is explained in detail based on the operation gestalt shown in drawing. It is the liquid crystal display concerning this invention which is shown in drawing 1 with a sign 1, and this liquid crystal display 1 of the point which is that in which the lighting system which can blink according to the luminosity of the circumference at the time of view ** is prepared is the same as that of the thing of the conventional example.

[0010] Moreover, also in the liquid crystal display 1 of this invention, since it shall be prepared in the ** transparent touch panel 3 like the thing of the conventional example at the view visual direction side of the liquid crystal display element 2, in order to protect the liquid crystal display element 2 from the press when operating the aforementioned transparent touch panel 3, the point that a guard plate is needed is the same as that of the thing of the conventional example.

[0011] It notes that the guard plate which it is needed and must be prepared by this invention here as stated above is formed by the transparent member by the resin. It is what is planned in order it shall serve as the light guide plate of a lighting system using this guard plate and to form the guard-plate combination light guide plate 4. Reflective section 4b made into the linear detailed crevice (or heights) or the punctiform detailed crevice (or heights) is prepared in field 4a by the side of view ** of the aforementioned guard-plate combination light guide plate 4 to meet this purpose.

[0012] in addition, to board thickness side 4c of the aforementioned guard-plate combination light guide plate 4 The light by which the light sources 5, such as a cold cathode fluorescent lamp and a Light Emitting Diode lamp, should confront each other, incidence of the light should be carried out into this guard-plate combination light guide plate 4, and incidence was therefore carried out into the guard-plate combination light guide plate 4 from the light source 5 It becomes the lighting system 6 which reflects by reflective section 4b made into the detailed crevice or detailed heights given to field 4a by the side of view **, changes travelling direction, and becomes what reaches 4d of fields by the side of the display device of the guard-plate combination light guide plate 4, and is injected, namely, illuminates the liquid crystal display element 2.

[0013] It is an example of the configuration of reflective section 4b given to field 4a by the side of view ** of the aforementioned guard-plate combination light guide plate 4 which is shown in drawing 2 . One is formed as an approximate circle drill-like crevice, the distribution state to field 4a by the side of view ** of this reflective section 4b is adjusted, and it is made, as for reflective section 4b, for the light injected from 4d of fields by the side of a display device, i.e., the light which illuminates the liquid crystal display element 2, to become a uniform luminosity in this example.

[0014] In addition, according to the result of the trial production by the artificer, and examination, as shown not only in the crevice of the shape of an above approximate circle drill but in drawing 3 , the aforementioned reflective section 4b although the linear crevice of the letter of the cross-section abbreviation for V characters, i.e., reflective section made into shape of slot 4b, is sufficient as one or illustration is omitted -- one -- an approximate circle drill-like crevice -- ***** -- further -- one -- the crevice of the letter of the cross-section abbreviation for V characters, i.e., a ridge, -- it is checked that it is that as which a ** is sufficient

[0015] Here, if the composition of the aforementioned guard-plate combination light guide plate 4 is considered still in detail, first, reflective efficiency will improve, so that the function as a light guide plate has one large size of the aforementioned reflective section 4b, and the light effect to the liquid crystal display element 2 will improve. On the other hand, the reading nature of the content of a display which the smooth nature of field 4a by the side of view ** is spoiled, and is displayed on the liquid crystal display element 2 falls, so that one size of the aforementioned reflective section 4b is large.

[0016] If an artificer states in the example of the crevice of the shape of an approximate circle drill shown by drawing 2 as a result of also examining this point, then, one path M of reflective section 4b and depth D, When the example of the shape of a slot of drawing 3 (linear crevice) described, it was checked that it is possible to consider as the guard-plate combination light guide plate 4 with which 0.3mm or less, then the above-mentioned light effect are satisfied, and reading nature also spoils no one flute widths W of reflective section 4b and depth D.

[0017] By having considered the guard-plate combination light guide plate 4 as the above-mentioned composition, although the liquid crystal display element 2 of the point used as what is illuminated by the outdoor daylight from a view ** side is the same as that of the thing of the conventional example when the circumference has switched off the light source 5 brightly, when the circumference turns on the light source 5 darkly, it is illuminated by the light source 5 and the guard-plate combination light guide plate 4 6, i.e., a lighting system, from a view ** side.

[0018] Since the liquid crystal display element 2 becomes what is always used as a reflected type, by this invention, the thing which set up transmittance highly so that it might be suitable for using it as a reflected type as a liquid crystal display element 2 and which is called the so-called reflected type has been used for this. therefore, in the liquid crystal display 1 of this invention, it shall be alike chiefly and shall be prepared from outdoor daylight and the lighting system 6 in the reflecting plate 7 in which light is reflected at the tooth-back side of the liquid crystal display element 2

[0019] By having considered as the composition of explanation above, when the liquid crystal display 1 of this invention has the bright circumference, when the circumference is dark, it becomes what functions as a reflected type, and a reflected type, a penetrated type, and a mode of operation do not change like the conventional example. Therefore, change of display quality, such as a fall of the contrast by change of a mode of operation, is not produced, either. Moreover, the lighting system prepared in the tooth back of the conventional liquid crystal display element 2 by having considered as the guard-plate combination light guide plate 4 becomes unnecessary naturally, and thin shape-ization of a liquid crystal display 1 of it is attained.

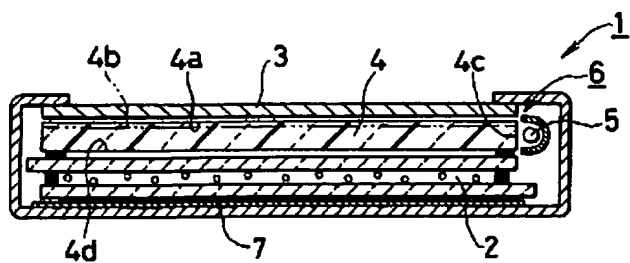
[0020] Moreover, by the liquid crystal display element 2 having been made into the thing only for reflected types with high transmittance, it becomes what can read slight outdoor daylight or a display, and while reducing the situation that lighting of a lighting system 6 is needed, the battery life of the portable equipment as which this liquid crystal display 1 is adopted is lived long to a monostromatic as that in which the thing of low powers, such as for example, a Light Emitting Diode lamp, can also fully read the light source 5 of a lighting system 6.

[0021] In addition, if the guard plate for the transparent touch panel 3 necessarily not being formed in the front face of the liquid crystal display element 2, for example, protecting the liquid crystal display element 2 is actually prepared in operation, it is possible to carry out using the guard plate. Moreover, in order to unify display quality with the time of lighting and un-illuminating, the lighting system 6 of this invention may newly be formed in the front face of the liquid crystal display element 2, and, in any case, a suitable operation and an effect can be expected.

[0022]
[Effect of the Invention] The guard-plate combination light guide plate with which the lighting system prepared the reflective section in the field by the side of view ** of the guard plate of a transparent touch panel by this invention as explained above, It consists of the light source confronted with the board thickness side of this guard-plate combination light guide plate, and a liquid crystal display element is having considered as the liquid crystal display used as the reflected type. in the first place By having made the guard plate adopted from the former serve a double purpose as a light guide plate, and having made it serve as a lighting system It makes it unnecessary to prepare a lighting system in the rear face of a liquid crystal display element, marked thin shape-ization of the liquid crystal display used for this kind and a portable equipment is enabled, and the effect which was extremely excellent in the miniaturization of a portable equipment and lightweight-ization is done so.

[0023] By having considered as the above-mentioned composition the second, also at the time of lighting of a lighting system moreover, also at the time of an astigmatism LGT Read of a display shall be performed as a reflected type and, as for a liquid crystal display element, a mode of operation changes to a penetrated type and a reflected type in the time of lighting and an astigmatism LGT like the conventional example. It cancels display grace, such as a fall of contrast, having changed in connection with this, and having made sense of incongruity hold in a user, and the effect which was extremely excellent in improvement in display quality is done so.

[Translation done.]



[Translation done.]